

# Researching Race in Mathematics Education

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**Background:** *Within mathematics education research, policy, and practice, race remains undertheorized in relation to mathematics learning and participation. Although race is characterized in the sociological and critical theory literatures as socially and politically constructed with structural expressions, most studies of differential outcomes in mathematics education begin and end their analyses of race with static racial categories and group labels used for the sole purpose of disaggregating data. This inadequate framing is, itself, reflective of a racialization process that continues to legitimize the social devaluing and stigmatization of many students of color. I draw from my own research with African American adults and adolescents, as well as recent research on the mathematical experiences of African American students conducted by other scholars. I also draw from the sociological and critical theory literatures to examine the ways that race and racism are conceptualized in the larger social context and in ways that are informative for mathematics education researchers, policy makers, and practitioners.*

**Purpose:** *To review and critically analyze how the construct of race has been conceptualized in mathematics education research, policy, and practice.*

**Research Design:** *Narrative synthesis.*

**Conclusion:** *Future research and policy efforts in mathematics education should examine racialized inequalities by considering the socially constructed nature of race.*

## INTRODUCTION

I open this article by recalling a joke that I saw scrawled on a wall at the University of California at Berkeley campus several years ago when I was

a graduate student in the Department of Mathematics. That joke asked, “What do you call a black man with a PhD in theoretical physics from MIT?” The answer, scrawled right below in even larger letters, was “NIGGER!” During that same time frame, the chair of the Department of Mathematics at Berkeley proclaimed in a campus magazine article on diversifying the faculty that, other than the eminent statistician Dr. David Blackwell, there were no truly great black mathematicians in the world. It should be noted that in Berkeley’s entire history, there has only been one tenured African American faculty member in mathematics.<sup>1</sup>

Twenty years later, as a scholar in mathematics education, I find myself confronting similar race-based sentiments in research and policy discussions focused on African American learners and mathematics in the K–12 context. For example, in a widely proliferated statement, it has been claimed—based on results from the National Assessment of Educational Progress (NAEP)—that African American 12th graders possess mathematics skills and abilities at the level of white eighth graders (e.g., Education Trust, 2003; A. Thernstrom & S. Thernstrom, 2004; S. Thernstrom & A. Thernstrom, 1999).

In a post-civil rights era in which some have argued for the declining significance of race or advocated for a color-blind approach (e.g., D’Souza, 1995; Wilson, 1978), it is tempting to view the described incidents and statements as merely anecdotal, independent, and carrying little weight in discussions that attempt to explicate the roles of race and racism in mathematics learning and participation. Because faculty and students at UC Berkeley are known for their commitments to social justice, it could be argued that those incidents must have been aberrations. That is, they represented the sentiment of one disgruntled individual in a sea of contrary thinking and the comments of a department chair simply calling it like it is, with no racist intent or malice.

In defense of the chair, one might argue that annual data do show that there are few African American PhD recipients in mathematics, accounting for the limited pool of potential faculty, and that only a few of these recipients join the faculties of major universities, evidence for claims about quality (e.g., National Science Board, 2004).

Moreover, because of the objectivity that is often assumed for outcomes on national assessments such as the NAEP, there are those who would insist that the statement about African American 12th graders and White eighth graders is factual and indisputable (e.g., A. Thernstrom & S. Thernstrom, 2004; S. Thernstrom & A. Thernstrom, 1999). To suggest that that the formulation and proliferation of such a statement has anything to do with the way modern-day racism operates in U.S. society is likely to be met with great resistance.

The purpose of this article is to provide a critical analysis of how race, racism, and racialized inequality have and have not been addressed in extant mathematics education research, policy, and practice. I argue that the described incidents and statements are not isolated or independent, nor are they aberrations confined to the elite, narrow context of a single university mathematics department or to a single education policy report. What might appear as localized discourses and events are, in fact, smaller pieces of larger societal narratives and racial projects (Omi & Winant, 1994) that serve the purpose of constructing and reifying not only African Americans but also Latinos and Native Americans as intellectually and academically inferior no matter how significant their accomplishments.

What these incidents and statements also highlight is that, although many scholars and laypeople conceive of mathematics and mathematics learning as neutral and value free (Ernest, 1991), race and racism *are* important considerations. At the individual level, there are those, like the anonymous joke writer and the department chair, who appear to believe in a racial hierarchy of mathematics ability that positions those who are identified as African American, Latino, and Native Americans at the bottom. Structurally, systems of White privilege help maintain this hierarchy not only within mathematics education (Ernest; Powell, 2002; Tate, 1995a, 1995b) but in the larger society as well.

Because mathematics education does not unfold in a vacuum, the ensuing discussion of race, racism, and racialized inequality will necessarily include references to interpretive and theoretical frameworks that are used outside of mathematics education (e.g., Bonilla-Silva, 1997, 2001; Essed, 2002; Lewis, 2003a, 2003b, 2004; Omi & Winant, 1994). Drawing on analyses of the ways that race and racism are conceptualized and studied outside of mathematics education will help illustrate the need for similar kinds of analyses within mathematics education. I argue that rather than exploiting the usefulness of sociological and critical theory frameworks, the vast majority of mainstream mathematics education research and policy purporting to explain so-called racial achievement gaps between African American, Latino, and Native Americans on one hand, and White and Asian students on the other, continues to rely on inadequate and impoverished approaches to race, racism, and racialized inequality.<sup>2</sup>

Against this backdrop, my goals for this article are to influence mathematics education research, policy, and practice. Clearly, research, policy, and practice are interrelated. Problems of practice are often reinforced by limitations of research and restrictive educational policies. Moreover, educational policies may misrepresent or oversimplify insightful findings

from educational research. Yet practice can often be improved via insightful research and the implementation of visionary policies.

First, I seek to alter the way that race is conceptualized in mathematics education research. I will argue that, in future studies, race should be understood as a sociopolitical, historically contingent construct. Although sociologists have long pointed out that meanings for race are embedded in the systems of racism that exist in the larger society, extant mathematics education research has typically failed to acknowledge the socially constructed and sociopolitical character of race. As a result, research studies purporting to consider race as a factor in mathematics achievement and persistence often invoke it simply to create categories for ease of analysis. Typically, there are no linkages to its meanings in the larger society or to the ways that racism is experienced as a result of these meanings (e.g., Kenney & Silver, 1997; Lubienski, 2002; Strutchens & Silver, 2000). Therefore, embedded in this first goal is a call for additional research on the everyday nature of racism in students' mathematical experiences (e.g., Berry 2003, 2005; Martin, 2000, 2006a, 2006b; Stinson, 2004; Thompson & Lewis, 2005) as well as the institutional and structural forces that allow racism to function in these experiences (Oakes, 1985, 1990; Oakes, Joseph, & Muir, 2001).

Second, I seek to alter the ways that policy makers conceptualize the aims and goals of mathematics education for African American, Latino, and Native American students and the ways that they frame the skills and abilities of these students based on inadequate conceptualizations of race, mathematics ability, and achievement. Goals that are motivated by a singular focus on "closing the racial achievement gap" carry with them assumptions about the inferiority of African American, Latino, and Native American students. Also implicit in these goals is the suggestion that if these students are to become more "proficient" and "high achievers," they must become less African American, Native American, and Latino, and more like White and Asian students in terms of their dispositions and values (Martin, 2007). Rendering African American, Latino, and Native American children as changeworthy in this way contributes to their social devaluation in schools and society.

Similarly, the goal of increased participation in mathematics, science, and engineering among African American, Latino, and Native Americans for the purpose of maintaining U.S. competitiveness (e.g., National Research Council [NRC], 1989; RAND Mathematics Study Panel, 2003; U.S. Department of Education, 1997) carries with it a short-sighted, enlightened self-interest rather than deep moral concern about, or commitment to, the well-being of these groups (Secada, 1989).

Third, I seek to influence mathematics teachers' day-to-day work with

students by pointing out that mathematics classrooms are highly racialized spaces and that color-blind, race-neutral approaches to student identities only perpetuate inequality (Brewley-Kennedy, 2005; Reed & Oppong, 2005). Mathematics teacher development efforts should not only focus on content knowledge and pedagogical content knowledge for teachers but also include developing teachers' awareness that classroom practices influence the construction of academic and mathematical identities and that these identities are coconstructed with students' racial identities (Martin, 2000, 2006a, 2006b). Designing mathematics classroom practices that promote the development of positive racial and mathematical identities and that situate the learning of mathematics in the social (and racial) realities confronting students should be goals for all mathematics teachers (e.g., Gutstein, 2003, 2005).

In exploring the issues raised, my discussion is structured to focus on (1) racial apathy and color blindness as dominant orientations to race and racism within mainstream mathematics education research, policy, and practice, (2) an analysis of the ways that race has been conceptualized in extant mathematics education research and policy, (3) the relevance of a social constructionist perspective on race for mathematics education research, and (4) a deconstruction of the *racial hierarchy of mathematical ability*. Table 1 highlights the areas where my critiques of mainstream mathematics education are focused.

**Table 1. Approaches to Race in Extant Mainstream Mathematics Education Research, Policy, and Practice**

Conceptualizations of race	Conceptualizations of learners	Research, policy, and practice orientations to race and racism	Aims and goals of mathematics education research, policy, and practice
Races as biologically determined. Race as a way to disaggregate testing data. Race as a causal variable for mathematics achievement.	Those who know mathematics. Those who do not know mathematics. Those who are mathematically literate. Those who are mathematically illiterate. Students belong to a racial hierarchy of mathematical ability.	Resistance to the realities of racism. Color blindness. Racial apathy. Solution on demand. Interest convergence.	Close the racial achievement gap. Maintain White privilege and United States international competitiveness.

I conclude with a call for research that is grounded in a perspective that conceptualizes mathematics learning and participation as *racialized forms of experience*—that is, structured by the relations of race that exist in the larger society. Such a perspective underscores the fact that all students—not just those identified as African American, Latino, and Native

American—experience mathematics learning as a racialized endeavor (Martin, 2000, 2006a, 2006b).

Although my discussion is centered squarely on race, I do not offer a simplistic prescription for how to research race in mathematics education. I avoid, for example, the tendency to explain achievement disparities based on the widely held assumption that race is a causal variable rather than a sociopolitical construct. Just as race is socially constructed, I claim that achievement differences and “racial gaps” are also socially constructed and contingent. They are not real in the sense that they tell us anything factual, objective, or indisputable about African American, Latino, Native American, Asian American, or White children. What these so-called gaps do highlight are the adverse conditions under which some children are often forced to learn, the privileged conditions afforded to others, and how forces like racism are used to position students in a racial hierarchy. I will, however, discuss whether events like those described offer any clues about why achievement and persistence patterns among White, Asian American, African American, Latino, and Native American students in the K–12 context have been constructed as racial and why there has been so little progress in remedying negative trends in achievement and persistence.

In focusing on race, I am well aware of at least two potential critiques: failure to consider intersectionality, and positioning students of color as objects of oppression (Sheets, 2003). My analysis does not imply that race, class, and gender intersections are unimportant. However, more nuanced understandings of race—understandings that do not reinforce deficit explanations for disparities in achievement and schooling experiences—must be developed among mathematics educators and policy makers if these intersections are to be considered.

In addition, I am very cognizant of the fact that individuals and communities of color are not passive recipients of racist behavior. This has been documented in the work of education historians (e.g., Anderson, 1988, 2004; Williams, 2005). In my own research with African American adolescents and adults, I discuss the roles of individual and collective agency in their struggles against oppression (Martin, 1998, 2000, 2006a, 2006b). Firsthand accounts of these struggles have revealed a richer and more complex picture of the life and mathematical experiences of African Americans than is typically portrayed in mathematics education research and policy literatures. More important, the reality of racism is typically embedded in these richer descriptions. To overlook this would amount to a dishonest representation of everyday life for these individuals and their communities.

Finally, my discussion is limited to race as it plays out in mathematics

education within the U.S. context. There is, of course, a global context to race, racism, and racialized inequality, but I do not take up those broader issues here.

### ORIENTATIONS TO RACE IN MATHEMATICS EDUCATION: RACIAL APATHY, COLOR BLINDNESS, AND SOLUTION ON DEMAND

In addition to arguing that race is inadequately conceptualized in mathematics education, I argue that the dominant orientations to race among mainstream mathematics education researchers, policy makers, and practitioners mirror those found in the larger society. These orientations have emerged in the post-civil-rights era as hallmarks of what sociologists have called the *new racism* (Bonilla-Silva, 2003, 2005). This new racism is partly characterized by the forceful denial—often against the backdrop of meritocratic ideals, political conservatism, or claims of reverse discrimination—of evidence showing that racism continues to mitigate the contemporary life experiences and opportunities of non-Whites (Bonilla-Silva, 2003; Forman, 2004; Lewis, 2004). This new racism suggests that racism is a thing of the past and that Whites today are not responsible for prior historical events and conditions. Equal opportunity exists for all who choose to seize it. In education, several studies have revealed that many White teachers demonstrate overt forms of resistance that are emblematic of this new racism, especially when their assumptions about African American, Latino, Native American, and Asian American students, and Whiteness are challenged (e.g., Gay, 2000; Gordon, 2005; Ladson-Billings, 1994; Leonard & Dantley, 2005; Marx & Pennington, 2003; Sleeter, 1993).

Resistance to the continued realities of racism is also manifested in *racial apathy*, characterized by Forman (2004) as “the lack of feeling or indifference toward societal racial and ethnic inequality and lack of engagement with race-related social issues. It is expressed in at least two ways: lack of concern about racial and ethnic disparities and an unwillingness to address proximal and distal forms of racially disparate treatment” (p. 44).

Outside of the relatively few studies that do attempt to consider race, the vast majority of mainstream mathematics education research exemplifies the racial apathy orientation. Lubienski and Bowen (2000), in an analysis of approximately 3,000 mathematics education research articles published between 1982 and 1998, found very little attention given to issues of equity and particular ethnic groups. In defining ethnic groups, Lubienski and Bowen used “descriptors pertaining to both general ethnicity and specific ethnic groups as well as to immigrants and other non-

native English speakers” (p. 628). However, they did not highlight or define race in their analysis or distinguish studies that purported to examine race. This may suggest that ethnicity and race are often equated in mathematics education research. Specifically, they found only 112 articles pertaining to ethnicity. Only 32 of these appeared in U.S. math education journals, and only three appeared in international math education journals. In general, issues pertaining to ethnicity have been confined to special issues of journals or to special sections of handbooks, or transformed into more palatable discussions involving broad visions of equity and diversity. Race and racism have received less attention.

Lubienski and Bowen (2000) also noted that because the vast majority of articles focused on student achievement, “one gets the impression that researchers look primarily at outcomes of these equity groups and rarely examine how schooling experiences contribute to these outcomes” (p. 631). The narrow focus on achievement outcomes is consistent with a widely accepted if-then proposition inherent in mathematics education research and policy: If so-called racial achievement gaps are closed, then students will have equal opportunity to use their mathematical skills and knowledge in school and society (Martin, 2007). This proposition ignores, and denies, the reality of racism in the lives of many students and fails to account for their adaptive responses to their racialized experiences (Berry, 2003, 2005; Martin, 2006a, 2006b; Stinson, 2004).

Sociologists have used the term *color-blind racism* to describe these denials even in the face of overwhelming evidence that color-coded inequality continues to exist in society (e.g., Bonilla-Silva, 2003; Lewis, 2003a, 2003b, 2004). Forman (2004) identified four main beliefs undergirding this ideology of color blindness: (1) society functions as a racial meritocracy, (2) people no longer care about or notice race, (3) any racialized patterns of social inequality that do persist are outcomes of individual and/or group-level cultural deficiency, and (4) because of the first three beliefs, nothing systematic needs to be done or should be done to redress racialized outcomes.

Lewis (2004) described how this color-blind ideology often stalls conversations on racial inequities by suggesting, “It stigmatizes attempts to raise questions about redressing racial inequality through accusations such as ‘playing the race card’ or ‘identity politics,’ which suggest that one is bringing race into a situation or conversation where it previously did not exist and in which it does not belong” (p. 635).

Color-blind racism is particularly salient among teachers who make proclamations such as, “I don’t see color, only children and students” (Gay, 2000; Ladson-Billings, 1994). This approach to race is particularly



harmful to African American, Latino, and Native American students. According to Ladson-Billings (1994),

Given the significance of race and color in American society, it is impossible to believe that a classroom teacher does not notice the race and ethnicity of the children she is teaching. Further, by claiming not to notice, the teacher is saying that she is dismissing one of the most salient features of the child's identity and that she does not account for it in any of her curricular planning and instruction. (p. 33)

Such denials also occur among mathematics education researchers and policy makers through one of two means: (1) advocating for overly broad, assimilation-oriented slogans such as "Mathematics for All" and "Algebra for All," or (2) direct avoidance of race and racism under the assumption that larger contextual forces are too complicated and beyond their control, so it is best to leverage those in-school factors that relate directly to mathematics learning and teaching—that is, curriculum, pedagogy, and assessment (NRC, 2001; RAND Mathematics Study Panel, 2003).

Reed and Oppong (2005) recently documented how color-blind racism affected the beliefs and classroom practices of two National Board-certified mathematics teachers. They noted that although both teachers talked about equity in ways that were consistent with standards documents from the National Council of Teachers of Mathematics (NCTM) and the National Board for Professional Teaching, these teachers were unable to effectively address racism in their teaching practices:

Even though [one teacher] talked about colorblindness and creating a neutral classroom for her students, in the end race played a complex role in her use of an athletic career to motivate her students. While she might not have consciously made the connection between Black students and professional basketball players, avoiding race as a relevant construct in society kept her from being sensitive to the message that she was sending to her students about what they might strive to be. . . . In the end, those high expectations for all students required by NCTM under the *Equity Principle* (NCTM, 2000), though maybe a goal for these two teachers, were repressed by issues of race and SES. (p. 13)

Another way that racism and racialized inequality are resisted, particularly in the context of mathematics teaching and learning, is through

what I call *solution on demand*. I have witnessed this on several occasions with scholars who make professional presentations on minority students and mathematics education. I often experience it firsthand when I am asked to speak with teachers and administrators regarding mathematics achievement and persistence among African American students. Despite insisting on the complexity of these issues, some version of the following is inevitably asked: "What you have said is fine, but tell me, specifically, what I should do *today* when I go back to my school or classroom to work more successfully with African American students?" In most cases, this is a sincere request. However, because these audiences are initially unaware of the degree to which I foreground race in my research, demanding an immediate and simple solution once they discover this can also be seen as a strategy used to hastily get past discussions of race and racism.

Such a demand not only trivializes the complexities of these issues but also the experiences of those who suffer racial injury. In essence, the demand for immediate solutions is a way to resist the realities of racism by reducing the harms to simple problems with simple solutions. My hesitancy to provide specific answers is not meant to suggest that no solutions exist. But top-down, externally generated solutions that are not responsive to the needs and conditions of the context in question are unlikely to have a meaningful and lasting effect.

Recognizing the reality that teachers do have to return to their classrooms, my response to these demands has always been to point out that although parts of the solutions are structural in nature, there are also components of the solutions that are highly contextual. That is, they are site specific and a function of the teacher, his or her students, their classroom practices and norms, their school, and the community context in which mathematics teaching and learning unfold. I encourage teachers and school officials not only to honestly examine their own practices and beliefs but also to listen to the voices of students, parents, and community members to better understand what education and mathematics literacy means to them and why those meanings have emerged. I also encourage them to better understand and appreciate students' racial, academic, and mathematics identities and to more closely examine school and classroom practices to determine which of these practices promote positive and negative identities among students. Creating spaces for positive identity development is key.

Most of my recommendations to teachers and administrators have little to do with mathematics content. Whether African American, Latino, or Native American students can learn mathematics content should not be an issue in research or policy. Concluding that they cannot, based on test scores, overlooks the skills and abilities that students are able to

demonstrate in a variety of other contexts unrelated to pencil-and-paper tests and that often fail to tap into these abilities (e.g., C. D. Lee, 1995, 2004).

In my view, there is one additional reason why race and racism have received inadequate attention in mathematics education research, policy, and practice: to avoid implicating *individual* actors, namely White teachers who teach African American, Latino, Asian American, and Native American children. Although recent research and policy efforts in mathematics education have focused increasingly on teachers' mathematical content knowledge and pedagogical content knowledge as determinants of high-quality teaching (e.g., Hill, Rowan, & Ball, 2005), there has been little discussion of *who gets to teach* mathematics beyond these considerations (Martin, 2007). Moreover, pressure to satisfy highly qualified teacher standards as a result of No Child Left Behind has led to the commodification of mathematics teachers. This, in turn, has led to the proliferation of fast-track and alternative certification programs coupled with a zealousness to recruit retired engineers and scientists, former military personnel, and a host of other career changers who have backgrounds in mathematics. In some instances, these programs have adopted missionary-like goals relative to African American, Latino, and Native American children and positioned White teachers as the saviors of these children (Darling-Hammond, 1994; Martin).

The narrow focus on content knowledge and pedagogical content knowledge (e.g., Hill, Rowan, & Ball, 2005; RAND Mathematics Study Panel, 2003) often glosses over such questions as, Who are these teachers? How are they perceived by students? How do these teachers construct ideas and beliefs about mathematics ability among their students? How are these constructions affected by teachers' beliefs about race? (Bol & Berry, 2005; Brewley-Kennedy, 2005; Gutiérrez, 2002; Martin, 2007; Reed & Oppong, 2005). Few, if any, of these questions get addressed in specific studies or in broad theoretical formulations of mathematics teacher knowledge (e.g., Hill et al., 2005; RAND Mathematics Study Panel, 2003). Brewley-Kennedy argued that although many mathematics teachers possess mathematics content knowledge and pedagogical content knowledge, they often do not develop pedagogical content knowledge related to issues of equity or race—what Banks and Banks (1995) called an *equity pedagogy*, what Ladson-Billings (1994) called *culturally relevant pedagogy*, and what Milner (2003) called *racial competence*.

Although race is rarely addressed in research on mathematics teacher knowledge, race is still very salient with respect to mathematics teaching. This is because nearly 90% of K–12 teachers are White (National Center for Education Information, 2005). This is not the fault

of individual White teachers. However, it is a structural arrangement that benefits White teachers and White students and continues to privilege Whiteness as a social category (McCarthy, 2003). Yet, consistent with the racial apathy orientation described earlier in this article, this issue has received very little attention in mathematics education research and policy discussions.

In addition to their overwhelming presence in the teaching population, it is also true that the vast majority of mathematics education researchers and policy makers are White. As a result, I would argue that there appear to be prevailing scholarly and policy norms within mathematics education that suggest that if race and racism are to be discussed in research, policy, or practice contexts, it must be done in such a way as to appeal to the sensitivities of a mostly White audience or in ways in which Whites are not personally implicated in the inequities experienced by many non-Whites. A clear weakness of this racism-as-individual conceptualization is that one's personal contribution to the racialized nature of students' mathematical experiences can be easily denied or avoided with the claim, "I am not a racist" (Bonilla-Silva, 2001, 2003; Lewis, 2004). This perspective also leads to the false conclusion that, after controlling for a few bad individuals, students' experiences in mathematics would be fair and equitable. What is often overlooked is that, beyond the good or bad intentions of individual Whites, *Whiteness*—as part of a large system of racism—operates to privilege these individuals as arbiters of what knowledge is valued in the field. The relative absence of research on race and racism (Lubienski & Bowen, 2000) supports this claim.

Given the inadequate approaches, and lack of attention, to race in mainstream mathematics education research, it is not surprising that there has been no systematic study of Whiteness and its relationship to mathematics participation, opportunity to learn, and achievement. This is true despite the claims of some researchers that they study race in their analyses of mathematics achievement (e.g., Lubienski, 2002; Strutchens & Silver, 2000).

It is worth noting that although individual-level considerations of racism are important, interpreting discussions that focus on race, racism, and racialized inequality as a call to carry out the search for racist individuals or as an essentialization of Whites is a misguided interpretation that overlooks an obvious consideration, as noted by Essed (2002):

It is necessary to make a clear distinction between the structural beneficiaries of racism and the actual agents of racism in everyday situations. That is, the dominant group structurally benefits from racism. This holds true for all its members, whether or not

they willingly accept this. . . . Nevertheless, it must not be assumed that all Whites are agents of racism and all [oppressed groups] only the victims. . . . It is also relevant to take into account the many dominant group members who incidentally or frequently oppose racism, whether in small or in significant ways. (p. 185)

I also concur with Lewis (2004), who stated that “trying to understand persisting patterns of racial inequality as the result of mean or ‘wrong-headed’ whites may well be much less effective than careful research on the structural and organizational practices that privilege whites” (p. 639). A structural perspective reminds us that individual actions take place in larger social systems where the meanings that are constructed for race are instrumental in shaping institutional practices and relations among people (e.g., Bonilla-Silva, 1997, 2001; Omi & Winant, 1994). Yet, hard distinctions between individual and structural, or focusing on one at the expense of the other, only serve the purpose of “severing rules, regulations, and procedures from the people who make and enact them, as if [individual racism] concerned qualitatively different racism rather than different positions and relations through which racism operates” (Essed, 2002, p. 178).

#### WHY IS RACE RELEVANT IN MATHEMATICS EDUCATION?

Despite the dominant orientations described previously in this article, considerations of race and racism must become central in mathematics education research, policy, and practice. Mathematics is the one area of the school curriculum that is consistently identified by the general public as representing the height of academic work, requiring the most “intelligence,” having the most hierarchal knowledge structure, and most able to distinguish those who are deemed intellectually “gifted” from those who are not (Ernest, 1991). Mathematics also plays a significant role in furthering the nation’s goal of maintaining its status as an economic, technological, military, and global superpower (e.g., National Science Board, 2003). Mathematics has been called “queen of the sciences” (E. T. Bell, 1951) and has long been conceived of by the general public as the ultimate means to achieve objectivity. As noted by Ernest, those who adopt an *absolutist*<sup>6</sup> view of mathematics would suggest that

mathematics has no social preferences. It just happens that certain sectors of the population, namely whites, males and members of the middle-class are intrinsically better equipped for

the demands of mathematical study. Their cognitive styles embody the properties described as mathematical values. Furthermore, according to this perspective, this is supported by historical evidence, since virtually all great mathematicians have belonged to this group. (p. 260)

Arguing against this neutral, value-free view of mathematics, critical mathematics educators have suggested that the enterprise of mathematics education—encompassing research, policy, and practice—plays a unique role in producing and maintaining racial inequity in U.S. society (e.g., Diversity in Mathematics Education [DiME] Center for Learning and Teaching, 2007; Frankenstein, 1990; Gutiérrez, 2002; Gutstein, 2003, 2005; Moses & Cobb, 2001; Powell, 2002, n.d.; Reyes & Stanic, 1988; Stinson, 2004; Tate, 1994, 1995a, 1995b; Tate & Rousseau, 2002).

When the issues of who can do mathematics and who gets to do mathematics are viewed through a critical lens, it becomes clear that beliefs about mathematical ability and the distribution of mathematical opportunity are informed by societal meanings for race and influenced by the power relations that exist in society between Whites and non-Whites. By way of example, consider the following statements, which were taken from *Everybody Counts* (NRC, 1989), one of the most influential policy documents in mathematics education over the last 20 years.

Over 25 percent of all high school students drop out before graduating. . . . Among Blacks, Hispanics, and Native Americans, the dropout rate often exceeds 50 percent. The majority of those who drop out are *functionally illiterate* and *hardly any of them possess enough mathematical skills* to make productive contributions to the American economy. *Dropouts and illiteracy* are destroying individual hope and *threatening the foundation of this country's economy*. Disparities that divide one third of our citizens from the rest *compromise the quality of life* for all citizens. (p. 12, italics added)

Apart from economics, the social and political consequences of *mathematical illiteracy* provide alarming signals for the *survival of democracy* in America. Because mathematics holds the key to leadership in our information-based society, the widening gap between *those who are mathematically literate* and *those who are not* coincides, to a frightening degree, with *racial* and economic categories. We are at-risk of becoming a divided nation in which knowledge of mathematics supports a *productive, technological powerful elite* while a *dependent, semiliterate majority, disproportionately*

*Hispanic and Black*, find economic and political power beyond reach. Unless corrected, *innumeracy* and *illiteracy* will drive America apart. (p. 14, italics added)

Broad-brush attempts to deal with underachievement in mathematics often aggravate the very problems they are trying to solve. Raising standards for graduation often widens the gap between *those who know* mathematics and *those who do not*, since increased standards are rarely accompanied by program changes to provide *appropriate courses* for *students who are not motivated* to study mathematics. (p. 13, italics added)

Currently, 8 percent of the labor force consists of scientists or engineers; the overwhelming majority are White males. By the end of the century, only 15 percent of net new entrants to the labor force will be White males. *Changing demographics have raised the stakes for all Americans. Never before have we been forced to provide true equality in opportunity to learn.* (p. 19, italics added)

In the United States, mathematics is primarily part of upper- and middle-class male culture. *Except for shopkeeper arithmetic of a bygone age taught in the elementary school, few parts of mathematics are embedded in the family or cultural traditions of the many large "developing countries"* that make up the American mosaic. (p. 20, italics added)

Such statements—precursors to the one about African American 12th graders and White 8th graders—are the kind that are typically woven into conversations about African American, Latino, and Native American students and mathematics. There are often strong associations between these students and negative peer culture, economic dependency, third-world status, and political powerlessness. These statements also illustrate how, in the course of objecting to mathematics being used as a filter for opportunity, the rhetoric of mathematics reform has simultaneously contributed to the social construction and reification of African Americans, Latinos, and Native Americans as mathematically illiterate. It is in this way that mathematics, more acutely than other curriculum areas, solidifies its widely acknowledged gatekeeper role in schools and society. This gatekeeping process privileges White males as the group that benefits most from knowledge of mathematics and as the group that others must emulate, and whose interests must be protected if they are to gain access to economic and political power.

These statements also help demonstrate that workforce needs and the threat of demographic changes, not moral compunction, are often what drive increased attention to underrepresentation issues in mathematics and science. As such, calls for increased participation by African American, Latino, and Native American students can be partly explained by critical race scholar Derrick Bell's (1992) concept of *interest convergence*. As explained by Delgado (2002), interest convergence suggests that "gains for blacks [and other minority groups] coincide with white self-interest and materialize at times when elite groups need a breakthrough for African Americans [and other minority groups], usually for the sake of world appearances or the imperatives of international competition" (p. 371).

Despite insight into these issues by critical mathematics educators, relationships between the ways that racism operates in the larger U.S. society (e.g., the social devaluation of *blackness* and African American, Latino, and Native American status) and the ways that it plays out within mainstream mathematics education research, policy, and practice have continued to received insufficient scholarly attention.

*Everybody Counts*, for example, is replete with statements such as those presented in the preceding paragraphs. Yet, at the time that it was published, there was no critical analysis of this document by mathematics educators on the grounds that it inadequately conceptualized race and that it failed to consider societal racism. This may have been due to the presence of the competing, and more appealing, rhetoric calling for increased participation in mathematics and science. Although the importance of this advocacy cannot be dismissed, it is not immune from criticism if it simultaneously contributes to stereotypical characterizations of African Americans, Latinos, and Native Americans and reinforces notions of a racial hierarchy of mathematical ability. As noted by Yosso, Parker, Solorzano, and Lynn (2005), "we must challenge the presence of racism in policies intended to remedy racism" (p. 19).

Because of the lack of attention to racism and the ways that it structures society, it could be argued that the framers of *Everybody Counts* assumed that mathematical literacy would engender full participation in society. In fact, there is reason to question the belief that mathematics literacy translates smoothly into increased opportunity and meaningful participation in the larger society (Hall, 2002; Martin, 2003). As noted by Thomas (2000), the view that it does assumes that

the labor market functions in a race-neutral way—rewarding blacks and whites equally according to their cognitive abilities or "cultural capital." This view ignores the large body of empirical



research that demonstrates that this is not true. These studies demonstrate that because of racism in the labor market, African Americans do not receive financial reward commensurate with their academic and professional skills. (p. 4)

Recent mathematics education policy documents such as the *Curriculum and Evaluation Standards* (NCTM, 1989) and the *Principles and Standards for School Mathematics* (NCTM, 2000), which have served as the blueprints for mathematics teaching and learning in the United States, have begun to receive critical analysis in the midst of what have been called the *math wars*, ongoing political debates about how children should learn school mathematics and the best ways to teach it (Schoenfeld, 2004). In addition to laying a foundation for how the nation's children will be educated in mathematics, these documents began to address equity and diversity issues, issuing calls for increased participation by African American, Latino, and Native American students. However, only a handful of scholars have critiqued these documents for their framing of the aims and goals of mathematics education and their inattention to the realities of racism in the lives of African American, Latino, and Native American students and their communities (e.g., Apple, 1992; Secada, 1995; Stiff, 1990; Tate, 1995a, 1995b).

A race-focused critique can also be extended to much of the rhetoric framing *Mathematics for All* and *Algebra for All*—color-blind, assimilation-oriented movements that pervade current mathematics education research and reform agendas (e.g., NCTM, 1989, 2000; RAND Mathematics Study Panel, 2003). I suggest here and elsewhere (Martin, 2003; also see Apple, 1992; DiME, 2007) that the emphasis on *all* students is symptomatic of an uneasiness, or unwillingness among many math education researchers and policy makers to grapple with the complexities of race and racialized inequality. Although equity and diversity are addressed as more neutral options in these movements, discussions often stop short of race and racism. Powell (n.d.) noted that “this discursive tendency to omit race from consideration of diversity in American education signals an apparent desire within the dominant culture to avoid talking about a prickly reality” (p. 3). It is this uneasiness, and unwillingness to truly engage the meanings for race and the consequences of these meanings that will make it difficult to improve conditions for students whose mathematical experiences, all the while, continue to be racialized (Berry, 2003, 2005; Martin, 2006a, 2006b; Stinson, 2004; Thompson & Lewis, 2005).

Returning to the incidents that opened this article, a lack of critical analysis may also account for why the mathematics chair at Berkeley

failed to acknowledge that a department that continues to be overwhelmingly White and male constitutes a highly racialized (and gendered) space that normalizes and privileges Whiteness (and maleness) and influences societal beliefs about who can and cannot do mathematics. The chair also failed to acknowledge the social conditions and structural affordances that help maintain a largely White male faculty and that simultaneously mitigate African American, Latino, and Native American participation in mathematics.

The chair's apparent lack of attention to these issues adheres to a pattern of behavior and values endemic to the mathematics community. According to Ernest (1991),

among university mathematicians, the group who serve to define the subject, it is white males of the middle and upper classes who overwhelmingly predominate. The values of mathematicians have developed as part of a discipline with its own powerful inner logic and aesthetics. So, it would be absurd to claim that these values do nothing but explicitly serving the interest of the group. Nevertheless, whether accidentally or not, the fact is that these values do serve the interest of a privileged group. They advantage males over females, whites over blacks, and middle classes over lower classes, in terms of academic success and achievement in school mathematics. This promotes the interests of the more privileged in society, because of the special social function of mathematics as a "critical filter" (Sells, 1973, 1976) in terms of access to most well paid professions. Thus the covert values of mathematics and school mathematics serve the cultural domination of society by one sector. (p. 260)

Similarly, those who base their beliefs about mathematics ability on testing outcomes and who subsequently choose to proliferate statements such as the one proposed about African American 12th graders often fail to question the very nature of the assessment enterprise and its role in maintaining hierarchies of privilege and reifying notions about racial achievement gaps (Darder & Torres, 2004; Kohn, 2000). Strong societal beliefs in meritocracy, innate ability, and the objectivity of tests obscure findings that many achievement tests are biased toward middle- and upper-class White students because pretest items favoring low-achieving and African American, Latino, and Native American students are often rejected in the test construction process (Lubienski, 2002).<sup>4</sup> Using modern psychometric methods such as differential item functioning (DIF), it is possible to construct tests and other assessments that favor African

American, Latino, and Native American students (Wilson, 2007). Such a process would not only alter achievement disparities on particular measures and challenge assumptions about the abilities of students but would also reveal how so-called racial achievement gaps in mathematics achievement are sociopolitical constructions. Furthermore, those who make claims about ability based on such tests rarely specify how mathematics performance is distributed within groups along lines of gender, social class, immigrant status, and linguistic background and often fail to explain *similarities* in performance across student groups (Gay, 2000).

### CHALLENGING THE UNCONTESTED NATURE OF RACE IN MATHEMATICS EDUCATION: A SOCIAL CONSTRUCTIONIST PERSPECTIVE

Although there exists a small literature claiming to highlight or explain disparities in mathematics achievement and persistence along racial lines (e.g., Lubienski, 2002; Secada, 1992; Strutchens & Silver, 2000), very few researchers—including those working within the so-called *mathematics learning as social* perspective—have attempted to unpack their use of race in the context of mathematics learning and participation (notable exceptions include Berry, 2003; Gutstein, 2003; Martin, 2000, 2006a, 2006b, 2007; Powell, 2002, n.d.; Reed & Oppong, 2005; Stinson, 2004; Tate, 1994, 1995a, 1995b; Tate & Rousseau, 2002).

Although race is characterized in the sociological and critical theory literatures as socially and politically constructed with structural expressions (e.g., Bonilla-Silva, 1997, 2001, 2003; Essed, 2002), most studies of differential outcomes in mathematics education begin and end their examination of race with static categories and group labels that are used for the sole purpose of disaggregating data.<sup>5</sup> Racial groups, for example, appear in most studies of math achievement as biologically determined; students are reported as belong to certain “races,” and the performances of these races are then compared (e.g., Kenney & Silver, 1997; Lubienski, 2002; Strutchens & Silver, 2000). However, as noted by Bonilla-Silva (1997), “Races, as most social scientists acknowledge, are not biologically but socially determined categories of identity and group association. . . . Actors in racial positions do not occupy those positions because they are of X or Y race, but because X or Y has been socially defined as race” (p. 472).

Because of the way it is juxtaposed with a host of suspected explanatory variables for achievement and persistence outcomes—socioeconomic status and parent education level, for example—race often takes on the meaning of a fixed, causal variable rather than a historically and

politically contingent construct whose meanings are subject to resistance, contestation, and negotiation (e.g., Kenney & Silver, 1997; Strutchens & Silver, 2000). In some studies, ethnicity and social class are merged with what is called race (e.g., Strutchens & Silver).

Even in studies that attempt to give attention to race, it is often left lurking as a causal variable when other factors have been excluded. For example, in her analysis of “black-white mathematics gaps” on the NAEP, Lubienski (2002) stated, “an analysis of race and SES together in the 1996 data revealed that student SES failed to account for much of the Black-White achievement gap” (p. 269). Though informative, Lubienski did not define *race* in her analysis and used racial categories only for the purpose of disaggregating data. The finding that SES failed to account for Black-White achievement gaps could lead readers to conclude that race determines these differences. Lubienski did raise the issue of whether Black-White mathematics achievement gaps are attributable to “other factors, such as access to quality mathematics instruction” (p. 271). Missing from her analysis, however, is a discussion of how structural and everyday *racism* account for lack of access to quality instruction. Critical analysis of the studies by Lubienski and others (e.g., Kenney & Silver, 1997; Strutchens & Silver, 2000) highlights the lack of attention given to race as a sociopolitical construct and to racism as it is manifested in the mathematical experiences of students.

The socially constructed meanings for race are important for mathematics education in three ways. First, they are important to consider when mathematics education is situated in its larger sociopolitical context, a context characterized by long-standing inequitable patterns of access to mathematical opportunities on the one hand, and the simultaneous rhetoric of *Mathematics for All* on the other. Furthermore, patterns of inequity in mathematics education mirror those in other areas of life, in which racism is a major factor in producing these inequities. A failure to link race in the context of mathematics education to the way that race plays out in larger societal contexts has been a major limitation of extant research. This failure has mistakenly rendered mathematics education as being disconnected from the systems of oppression that order the rest of society.

Second, the socially constructed meanings for race are important in considering the aims and goals of mathematics education research and policy. A common outcome of these research and policy efforts is the designation of students who are deemed proficient or less than proficient. These labels are typically juxtaposed with the social categories used for race (Kenney & Silver, 1997; NRC, 1989; Strutchens & Silver, 2000; Tate, 1997).

Sociologist Robert Miles (1988) defined *racialization* as “any process or situation wherein the idea of ‘race’ is introduced to define and give meaning to some particular population, its characteristics and actions” (p. 246). Using this definition, I argue that mathematics education researchers and policy makers who use race in the way described in this article contribute to a racialization process that helps to marginalize African American, Latino, and Native American learners and maintain beliefs about a racial hierarchy of mathematical ability (e.g., Education Trust, 2003; NRC, 1989).

Third, socially constructed meanings for race are important in the everyday contexts in which individual students must struggle for mathematics literacy and negotiate both their racial identities and their identities as doers of mathematics (e.g., Berry, 2003, 2005; Cobb & Hodge, 2002; Gutstein, 2003; Martin 2000, 2006a, 2006b, 2007; Stinson, 2004). In many mathematics classrooms, teachers and students participate in a range of practices in which they develop, contest, and internalize beliefs about what counts as math literacy and who is mathematically literate, contributing to the construction of these classrooms as highly racialized spaces (e.g., Boaler, 2002; Martin, 2000; Nasir, Heimlich, Atukpawu, & O’Conner, 2007; Thompson & Lewis, 2005). However, research documenting these practices has only emerged in the last few years.

### THE RACIAL HIERARCHY OF MATHEMATICS ABILITY

The practice of addressing racial disparities in mathematics achievement without interrogating the socially constructed meanings for race has allowed commonsense, colloquial, post-civil rights orientations to race to prevail without challenge (Bonilla-Silva, 2001). Moreover, because little attention has been given to resistance, contestation, and negotiation of these meanings, disparities in mathematics achievement and persistence are often inadequately framed as reflecting race effects rather than as the consequences of the *racialized* nature of students’ mathematical experiences (Martin, 2000, 2006a, 2006b; Stinson, 2004).

One consequence of inadequate theorizing of race in mathematics education has been the perpetuation of a widely accepted, and largely uncontested, racial hierarchy of mathematical ability: Students who are identified as Asian and White are placed at the top, and students identified as African American, Native American, and Latino are assigned to the bottom. The uncontested nature of this hierarchy has contributed to the social construction of African American, Latino, and Native American students as less than ideal learners; that is, to be African American or Latino or Native American is to be mathematically illiterate

in a way that is represented as natural and biologically determined (e.g., Herrnstein & Murray, 1994; NRC, 1989; A. Thernstrom & S. Thernstrom, 2004). The notion of a *general* hierarchy of mathematics ability is not new, as noted by Ernest (1991):

There is a widespread assumption . . . that there is a fixed linear hierarchy of mathematical ability from the least able to the most able (or mathematically gifted); every child can be assigned a position in this hierarchy, and few shift their position during the years of schooling. One important consequence of these stereotyped perceptions and expectations of pupils is the adoption of limited goals for the mathematical education of lower attaining pupils. (p. 244)

Rather than questioning and deconstructing the *racialized* nature of this hierarchy, many mainstream math educators accept it as their natural starting point. It is the premise on which a great deal of research, policy, and practice operates. This is confirmed via an analysis of the discourse that often characterizes discussions of what it means to close so-called racial achievement gaps in mathematic achievement. In most instances, this involves the idea of moving African American, Latino, and Native American students *from* their perceived positions of mathematical illiteracy to new positions of mathematical literacy—positions occupied by White and Asian students (NCTM, 1989, 2000; NRC, 1989; RAND Mathematics Study Panel, 2003). In more colloquial language, this is often framed as raising African American, Latino, and Native American students up to level of White and Asian students. This discourse is exemplified in the statements from *Everybody Counts* presented earlier. Not only is this goal problematic because of the identities it ascribes to African American, Latino, and Native American students, but it is also problematic because (1) it renders African American, Latino, and Native American students as changeworthy, needing to appropriate and mimic the actions and behaviors of students who are identified as White and Asian, (2) it sets an artificially low standard of achievement for African American, Latino, and Native American children, and (3) it privileges “White” as an ideal social category.

I would further argue that research and policy initiatives that frame the aims and goals of mathematics teaching and learning in terms of “closing the racial achievement gap” necessarily position researchers, policy makers, and practitioners to assume and accept beliefs about the inferiority of African American, Latino, and Native American children and their locations on the hierarchy of mathematics ability (Secada, 1995).

A counterargument would suggest that merely describing and reporting the “reality” of achievement and persistence outcomes in mathematics does not constitute racialization. However, research by Steele (1997) and Steele and Aronson (1995) on *stereotype threat*—the threat of being perceived as fitting a negative stereotype or the fear of poor performance confirming that stereotype—has clearly shown that discursive practices and policies that frame some students as at-risk and underachievers often have a negative affect on academic performance when this discourse becomes part of the social context in which students attempt to learn. Studies have also shown that these framings often become internalized by teachers and school officials, leading to deficit-oriented beliefs about African American, Latino, and Native American students and pernicious ways of sorting and stratifying these students for educational opportunities (e.g., Lewis, 2003b; Oakes, 1985; Sleeter, 1993).

An emerging literature on African American student success in mathematics (Berry, 2003, 2005; Martin, 2000, 2006a, 2006b; Moody, 2001; Nasir, 2002; Stinson, 2004; Thompson & Lewis, 2005) is beginning to challenge the racial hierarchy of mathematics ability. Researchers conducting these studies have frequently relied on firsthand accounts and explanations of African American student success as well as student commentaries about a number of community, school, and classroom practices identified as being important in their mathematical experiences. For example, Stinson conducted interviews with four mathematically successful African American males whom he followed through their high school and college years. He asked them, as college students and young adults, to reflect on their experiences with schooling and mathematics. Using critical race theory and critical postmodern frameworks, Stinson’s findings revealed that the participants had developed strong math identities that positively impacted their sense of agency. According to Stinson, this finding could, in part, be accounted for “in how they understood the sociocultural structures and discourses of U.S. society and how they accommodated, resisted, or reconfigured the specific discourses that surround African American males” (p. 180).

Moody (2001) and Berry (2003, 2005) conducted studies of African American female graduate students and African American male middle school students, respectively, who were successful in mathematics. Moody’s research examined linkages between African American students’ sociocultural orientations, personal and cultural identifications with mathematics, and their becoming successful in mathematics. Berry’s research used critical race theory to examine African American student agency and self-empowerment within, and through the use of, mathematics.

Thompson and Lewis (2005) profiled a young African American male named Malik who, “[realizing] the importance of advanced mathematics to his college and career goals . . . petitioned his principal to have a Pre Calculus/Calculus course offered at his school” (p. 6). Their study documented “the story of Malik’s success and in so doing, identified key themes that inform current understanding of the mathematics achievement and career attainment of African American male students” (p. 6).

Narratives from these and other studies (e.g., Martin, 2000, 2006a, 2006b) help illustrate that African American students are not passive recipients of racialized treatment in mathematics. African American students engage in sense-making processes that help them understand the way that race operates in their lives and in their mathematical experiences. Their success and stories about that success help to challenge the notion of a racial hierarchy of mathematics ability and beliefs about African Americans’ place within it.

#### THE SOCIOHISTORICAL CONSTRUCTION OF LEARNERS: DECONSTRUCTING THE RACIAL HIERARCHY OF MATHEMATICS ABILITY

Just as race is a sociopolitical construction, so are standards for who is judged to be mathematically literate. As part of this social construction process, existing mathematics education research and policies have facilitated the social devaluation of African American, Latino, and Native American students with respect to mathematics literacy while affording social appreciation to many White and Asian American students. This has legitimized the racial hierarchy of mathematics ability described earlier. It is important, however, to situate the racial hierarchy of mathematical ability in its larger sociopolitical and sociohistorical contexts to better understand how it has emerged and how socially constructed racial groups have been positioned in society relative to one another (Song, 2004).

A comparison of the societal meanings that have been ascribed to “being Black” and “being Asian” is informative to demonstrate how Blackness is devalued and Whiteness is privileged in U.S. society and within mathematics education research and policies. This comparison is particularly insightful because these identities are typically presented as polar opposites in discussions of mathematics ability: African Americans are represented as poor performers in mathematics, and Asian Americans, collectively, are represented as high achievers.

The disingenuous representation of Asian American students as model minorities—despite differential patterns of achievement within their



many subgroups—has been used to afford them status as *honorary Whites*,<sup>6</sup> situating them within a triracial system of Whites, honorary Whites, and *collective Black* (Bonilla-Silva & Glover, 2004; S. Lee, 1996; Zhou & Lee, 2004). Though conceived of in a broader sociological context, elements of this triracial social ordering can also be found in the context of mathematics education in which research and policy framings of the so-called racial achievement gap position African American, Latino, and Native American students on one side of a racial divide, and White and Asian American students on the other. In this hierarchy, African American, Latino, and Native Americans are assigned to the collective Black category.

However, the honorary White status afforded to many Asian Americans is limited to those occasions that serve the purpose of distinguishing between “good” and “bad” minorities and making the implicit suggestion that if one minority group can be successful, then claims of racism should not be excuses for the others (Bonilla-Silva, 2001, 2003; Bonilla-Silva & Glover, 2004). Interestingly, although the so-called Black-White achievement gap has received a great deal of attention, White-Chinese American, White-Korean American, and White-Japanese American gaps in mathematics achievement are rarely discussed, especially in ways in which limited cognitive abilities, poor motivation, and dysfunctional family backgrounds are used to denigrate White students.

The social construction of “Asian” extends to the international comparison context, in which mathematics performance by students from various Asian countries is framed *negatively* to invoke strong United States nationalism. Studies comparing American students (mostly White) and students from top-scoring Asian countries have characterized these countries as “Asian tigers” (NRC, 2001) and high Asian student performance as a threat to U.S. global standing. In addition, Asian students’ presence on American university campuses is often met with great resistance and resentment because of their success in math and science-based coursework. Takagi (1992), for example, noted how White students have used racist jokes, similar to the one that opened this article, to decry the number of Asian and Asian American college students enrolled in math and science programs: MIT is said to stand for Made in Taiwan, and UCLA is said to stand for University of Caucasians Living Among Asians. Here again, despite the willingness to manipulate public consciousness about Asian students, there remains a tendency to avoid pathological explanations of White students’ underachievement relative to Asian students. Instead, poor performance among Whites is often framed in terms of inadequacies in teacher knowledge and curriculum gaps (Stevenson & Stigler, 1992; Stigler & Hiebert, 1999; Wang & Lin, 2005).

Despite these very political and duplicitous uses of Asian and Asian American student performance, a historical analysis shows that, in the U.S. context, Asian American representation, persistence, and success in mathematics and science is partly rooted in *relative functionalism* (Sue & Okazaki, 1990)—an adaptive response to the social conditions, including racism, that prevented various Asian American subgroups from entering into other sectors of American life. Sue and Okazaki explained this adaptation as follows:

Using the notion of relative functionalism, we believe that the educational attainments of Asian Americans are highly influenced by the opportunities present for upward mobility, not only in educational endeavors but also in noneducational areas. Noneducational areas include career activities such as leadership, entertainment, sports, politics, and so forth, in which education does not directly lead to the position. To the extent that mobility is limited in noneducational avenues, education becomes increasingly salient as a means of mobility. That is, education is increasingly functional as a means for mobility when other avenues are blocked. (p. 917)

Relative functionalism also sheds light on the “effort, hard work, and cultural values” explanation that is so widely referenced in the context of Asian American student performance and that is used, by way of comparison, to devalue African American, Latino, and Native American cultural values with respect to education. Citing a number of studies (Dornbusch, Prescott, & Ritter, 1987; Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Ritter & Dornbusch, 1989), Sue and Okazaki (1990) concluded, “the findings do not support the cultural hypothesis that Asian Americans differ from other groups in achievement because of differences in upbringing” (p. 917). Scholars who rebut culture-only explanations of Asian American student success have argued that these explanations are incomplete precisely because they do not consider racism and discrimination faced by various Asian American subgroups throughout American history. The racialized aspect of Asian student success in mathematics and science is rarely discussed in mainstream mathematics education research and policy. Sue and Okazaki highlighted the research of Suzuki (1977), who

advanced the proposition that Asian Americans came to pursue education because of their status as a minority group. Many labor

unions discriminated against Asians, refusing them union membership during the 1940s. In addition, technological advancements and an expanding economy after World War II required educational professionals and white collar employees. Thus, one development limited occupational opportunities for manual laborers and the other placed a premium on professional-technical skills requiring advanced education. In such a situation, mobility through education took increased significance, above and beyond the contributions of Asian cultural values. (p. 918)

Mura (1996) argued that, from a historical point of view, Asian Americans collectively came to be seen as a model minority during the civil rights movement, as African Americans increasingly protested their condition and treatment in society. Mura further explained how African Americans and Japanese Americans, in particular, were positioned in society relative to each other and to Whites:

The whites insisted the Japanese Americans sit in front of the bus, drink from the white man's fountain, and use the white man's rest rooms even though suspecting their loyalty to the nation (Hosakawa, 1969). . . . The segregated buses meant that Japanese Americans were no less connected to blacks than to whites. The racial identity of Japanese Americans was formed not just by the internment camps, but also against the backdrop of race relations involving blacks and other people of color. . . . The bargain Japanese Americans accepted when they sat with whites was this: "We will let you be honorary whites under two conditions: First, you will never be able to drive the bus. Secondly, you must pay no attention to the people at the back of the bus; you must claim no relationship to the people at the back of the bus; and you must absolutely never, ever protest what is happening to the people at the back of the bus. If you do all this, we will pretend to ignore your color. And someone else will always be worse off than you."

By comparing the ways that African American and various Asian American subgroups have been socially constructed relative to each other, a large conceptual void with respect to so-called racial achievement gaps and designations of mathematical competence is revealed in mathematics education research and policy. In particular, mainstream mathematics education research has done little to shed light on how patterns

of participation and opportunity have developed historically and done little to challenge the ways that students and their abilities have been constructed against the backdrop of race.

As noted by Anderson (2004), it is also important to point out that the achievement gap is “far more complex than the difference between the test scores of students from minority groups and the White majority. It is also about the failure of White American students to meet standards set by federal and state governments” (p. 15). Anderson further noted,

It is due to the closing of the other achievement gaps that we can now focus so exclusively on the test score gap. It made no sense, for example, to focus on the test score gaps during the periods when African American students were denied basic access to elementary and secondary schools. Now that African Americans, through centuries of struggle for full equality, have finally gained more educational opportunities than before, a host of scholars and pundits seem puzzled and dismayed that Black students did not eliminate the test score gap. (p. 14)

I argue that, in failing to challenge and deconstruct the socially and politically constructed meanings for “Blackness,” “Whiteness,” and “Asian,” mainstream mathematics education research and policy facilitate the perpetuation of beliefs about a racial hierarchy of mathematical ability. By fostering public perception that differences in achievement and persistence reflect race and cultural effects and deficits rather than the racialized nature of students’ mathematical experiences, research and policy in mathematics education can be seen as contributing to the social devaluing of what it means to be African American, Latino, and Native American.

#### MATHEMATICS LEARNING AND PARTICIPATION AS RACIALIZED FORMS OF EXPERIENCE

How might race, racism, and racialized inequality be conceptualized in relation to mathematics learning and participation? What kinds of theoretical understandings of race might inform future work in mathematics education research, policy, and practice contexts? In formulating my arguments in this article and in my own research, I have drawn on the research of sociologists who analyze race and racism in macro, micro, and historical context (e.g., Bonilla-Silva, 1997, 2001, 2003; Essed, 2002; Forman, 2004; Lewis, 2003a, 2003b, 2004; Omi & Winant, 1994). In

defining and unpacking my use of the terms *race* and *racism*, for example, I reference the work of Essed, who stated,

“Race” is an *ideological construction*, and not just a social construction, because the idea of “race” has never existed outside a framework of group interest. As part of a nineteenth pseudoscientific theory, as well as in contemporary “popular” thinking, the notion of “race” is inherently part of a “model” of asymmetrically organized “races” in which Whites rank higher than “non-Whites.” Furthermore, racism is a *structure* because racial and ethnic dominance exists in and is reproduced by the system through the formulation and applications of rules, laws, and regulations and through access to and the allocation of resources. Finally, racism is a *process* because structures and ideologies do not exist outside the everyday practices through which they are created and confirmed. (p. 185)

I also draw on the notion of *racialized social systems* (Bonilla-Silva, 1997, 2001, 2003). Sociologist Eduardo Bonilla-Silva (1997) extends racialization processes to the development of a structural theory of racism:

This term refers to societies in which economic, political, social, and ideological levels are partially structured by the placement of actors in racial categories or races. . . . In all racialized social systems the placement of people in racial categories involves some form of hierarchy that produces definite social relations between the races. The race placed in the superior position tends to receive greater economic remuneration and access to better occupations and/or prospects in the labor market, occupies a primary position in the political system, is granted higher social estimation (e.g., is viewed as “smarter” or “better looking”), often has license to draw physical (segregation) boundaries between itself and other races, and receives what DuBois (1939) calls a “psychological wage” (Marable, 1983; Roediger, 1991/1999). The totality of these racialized social relations and practices constitutes the racial structure of a society. (pp. 469–470)

Essed’s (2002) work on the nature of everyday racism and Bonilla-Silva’s (1997, 2001, 2003, 2005) racialized social systems perspective are just two of many interpretive frameworks that mathematics education

researchers and policy makers might use in their analyses of students' mathematical experiences. Using these perspectives would help expose the fact that efforts to rank students' mathematical ability according to racial categories are part of larger racialization processes that, on the surface, appear to put forth objective findings but, based on more critical analysis, are designed to maintain racial hierarchies and socially construct African American, Latino, and Native American students as less than ideal learners. Other possibilities include the theory of *racial formation* (Omi & Winant, 1994) and *critical race theory* (Delgado & Stefancic, 2001; Ladson-Billings & Tate, 1995; Parker & Lynn, 2002). Each of these perspectives takes seriously the socially constructed and historically contingent nature of race and offers a challenge to the notion of a racial hierarchy of mathematical ability.

Given these theoretical possibilities, it is clear that future research on achievement and persistence inequities in mathematics education would address students' day-to-day experiences with race and racism (e.g., Martin, 2006a; Nasir et al., 2007), including teacher-student interactions, and the structural arrangements and practices that give rise to racialization processes (e.g., DiME, 2007; Oakes et al., 2001; Solorzano & Ornelas, 2002, 2004; Tate & Rousseau, 2002).

As I have argued here and elsewhere (Martin 2006a, 2006b), what is needed in mathematics education are theoretical conceptualizations and research approaches to inequality that move beyond static notions of race to acknowledge that mathematics learning and participation, like many other areas in life, can be viewed as *racialized forms of experience*—that is, as experiences in which the socially constructed meanings for race in society emerge as highly salient in structuring (1) the way that mathematical experiences and opportunities to learn unfold and are interpreted and (2) the manner in which mathematics literacy and competency are framed, including who is perceived to be mathematically literate and who is not.

This perspective also sets goals for mathematics education that include not only high achievement for students but also having them use mathematics to change the conditions of their lives in emancipatory and liberatory ways (e.g., Gutstein, 2005). Table 2 highlights how such a perspective differs from extant inadequate approaches to race in mainstream mathematics education research, policy, and practice.

In conceptualizing mathematics learning and participation as racialized forms of experience, new issues and questions arise. Issues of identity—racial, cultural, gender, mathematical—and agency become centrally important when seeking to better understand how students make sense of, and respond to, their mathematical experiences. Static racial

Table 2. Contrasting Approaches to Race in Mathematics Education Research, Policy, and Practice

	Conceptualizations of race	Conceptualizations of learners	Research, policy, and practice orientations to race	Aims and goals of mathematics education research, policy, and practice
<b>Mainstream mathematics education research, policy, and practice</b>	Races as biologically determined. Race as a way to disaggregate data. Race as a causal variable for mathematics achievement.	Those who know mathematics. Those who do not. Those who are mathematically literate. Those who are mathematically illiterate. Students belong to a racial hierarchy of mathematical ability.	Resistance to realities of racism. Color blindness. Racial apathy. Solution on demand. Interest convergence.	Close the racial achievement gap. Maintain White privilege and U.S. international competitiveness.
<b>Mathematics learning and participation as racialized forms of experience</b>	Race as a sociopolitical construction. Historically contingent nature of race. Consideration of racism and racialization.	Consideration of the negotiated nature of identity with respect to mathematics. Asks, What does it mean to be African American, Latino, Native American, White, and Asian American in the context of mathematics learning?	Consideration of everyday, institutional, and structural racism.	Empowerment and liberation from oppression for marginalized learners.

categories upon which societal meanings are imposed will no longer suffice. Neither will claims about race effects or the juxtaposition of racial category labels with designations of mathematical competence.

Within this perspective, it becomes apparent (Martin, 2000, 2006a, 2006b) that as students struggle to achieve mathematical literacy in school and in nonschool contexts, and as they attempt to negotiate and assert their own identities relative to the larger discourse that purports to explain African American students' achievement and persistence, they will (1) draw on and respond to socially constructed meanings race and racial categories and (2) negotiate and resist the racialization processes that attempt to position and confine African American students within an existing racial hierarchy.

In a series of studies (Martin, 1997, 1998, 2000, 2006a, 2006b) involving African American adolescents and adults, I have explored race and identity-related considerations, particularly the coconstruction of African

American and *mathematics identities* and how the socially constructed meanings for race emerge in these coconstruction processes. Mathematics identity refers to the dispositions and deeply held beliefs that individuals develop about their ability to participate and perform effectively in mathematical contexts and to use mathematics to change the conditions of their lives. A mathematics identity encompasses a person's self-understandings and how they are seen by others in the context of doing mathematics. Therefore, a mathematics identity is expressed in narrative form as a *negotiated* self, is always under construction, and results from the negotiation of our own assertions and the external ascriptions by others (Martin, 2006a).

I have also studied the roles of sociohistorical, community, and school forces (Martin, 2000). A central concern has been to explore how African Americans frame "being African American," "being a doer of mathematics," mathematics learning, and mathematics teaching. What this research has demonstrated is that race, racism, and racialization are important considerations in mathematics learning and participation, not because they have been imposed on the analyses, but because the African American adults and adolescents continue to bring these issues forward.

Narrative self-constructions of what it means to be African American for many of the participants in my own research have often been framed in terms of struggle yet perseverance. The struggle for mathematics literacy, in turn, has been characterized in ways in which the meanings for race, and the consequences of those meanings, are often very salient. However, unlike research that posits that African American students associate success with *acting White* (e.g., Fordham & Ogbu, 1986), or research and policy that suggests that African American students should adopt White or Asian American values toward education, my work has shown that mathematically successful African American students and parents not only maintain their sense of self as African Americans, but they also construct a number of other positive identities that contribute to their success. Most important, they situate mathematics education in the context of their lives *as* African Americans, with particular reflection on ways that racism plays out in their lives.

As an example, consider the following excerpt taken from an interview (Martin, 2007) with a 40-year-old African American mother of three children who was working as a substitute teacher in the San Francisco Bay area. She was also enrolled as a student at a California State University campus at the time of the interview. The interview was conducted as part of a study that focused on mathematics socialization and mathematics identity among African American adults and adolescents (Martin, 2002). When asked to react to the dominant explanations for the performance



and persistence of African American children in mathematics relative to White and Asian students, part of her response was as follows:

This system is not designed for African American children to learn. This system is designed for European children and if you were to design an Afrocentric method of teaching these children, they would excel in math, you know, they would do better. And I believe that until the day I die. That is the reason why these kids are not doing well. . . . African Americans have got to stop giving so much power to this system, that's why we are in the condition that we are in. We gave up the power so now we're in this dilemma. We thought [de]segregation was it and that's the worse thing that has ever happened to us. People didn't care about our kids. We were shoving our kids into places where people hated them. How are you going to teach somebody you hate? . . . I don't think Europeans should teach our children. Because our skins are a different color, they have a tendency to hurry up and get our kids out of their face. It's not about that. It's about making sure our children are really prepared. We think [de]segregation was the best thing, but it hindered us. It really hurt us because when our children came into those classes. Europeans looked at them, you know, they didn't want to get close to them.

Although mathematics education research and policy has contributed to their social devaluation, very few studies in mathematics education have privileged the voices, and counterstories, of African American, Latino, and Native Americans in this way. My research, similar to studies in other curricular areas and with different groups of students (e.g., Bettie, 2003; Carter, 2005; Davidson, 1996; Flores-González, 2002; S. Lee, 1996, 2005), suggests that future studies should not only examine the structural processes that facilitate racialized inequality but also should take up student-centered and identity-related questions such as those that follow. Such questions can help provide insight into how students exhibit agency to resist their marginalization, assert their own identities, and experience mathematics learning and participation. Work by Berry (2003, 2005), Moody (2001), and Stinson (2004) are examples of studies that have taken up these questions:

- What does it mean to be African American, Latino, Hmong, Mien, White, or Native American, for example, in the context of mathematics learning?

- What does it mean to be a learner of mathematics in an African American, Latino, Hmong, Mien, or Native American social context?
- How do students embrace or contest the racial or other identity-related ascriptions that are imposed on them, and how does this negotiation of identity affect mathematics teaching and learning?
- How do students contest the racialized renderings of their identities and abilities with respect to mathematics?
- In what kinds of school and nonschool contexts do students who are characterized as underachieving and underperforming manage to demonstrate high levels of mathematical ability? And how do experiences in these contexts positively affirm students' mathematical *and* racial identities?

All these questions focus attention on students' own narrative constructions—what critical race theorists call *counterstories* (Delgado & Stefancic, 2001; Parker & Lynn, 2002)—of their mathematical experiences vis-à-vis the ways in which these experiences are described by researchers, policy makers, or teachers. These questions also suggest that identity can be used as both an indicator and an outcome for students' mathematical experiences. If students see themselves as disconnected from various mathematical practices or have been marginalized because of race or some other component of their identity, negative aspects of their identities in relation to math are likely to emerge upon investigation. However, if students engage in experiences that reshape these math-related identities and simultaneously affirm their racial (or other) identities, they may feel empowered to use mathematics as a tool for change (Gutstein, 2003, 2005).

Issues of design, then, become centrally important as we consider how to engineer—at the everyday level and structurally—learning experiences that help students construct identities as doers of mathematics early in their school experiences, early enough to resist and challenge negative messages about race and ability that would otherwise become internalized (Tate, 2005). Work taking place in the context of Algebra Project (Moses, Kamii, Swap, & Howard, 1989; Moses & Cobb, 2001) and efforts focused on teaching mathematics for social justice (Gutstein, 2003, 2005) are examples that begin to address these issues.

Four of the most important elements found in the projects by Moses (Moses et al., 2001; Moses & Cobb, 2001) and Gutstein (2003, 2005), for example, are that they (1) acknowledge race as a sociopolitical construct

that operates to constrain the life opportunities of African American, Latino, and Native Americans while privileging Whites, (2) acknowledge community knowledge and reality, (3) provide meaningful learning opportunities and experiences that empower students to become *agents of social change*, and (4) stress alternative broader views of mathematics literacy that allows students to better understand the conditions of their lives and engage in the process of social critique. Gutstein (2005), working in the context of standards-based mathematics, helps facilitate students' use of mathematics to understand some of the issues in their social realities, such as racial profiling, discrimination in housing, and the conflict in Iraq. Moses (Moses et al., 1989, Moses & Cobb, 2001) links the learning of algebra to the historical struggle for civil rights for African Americans. Future research and policy should explore the benefits of such approaches in recognition of the fact that students' lives and mathematical experiences unfold as racialized experiences.

#### PAYING THE PRICE

A paraphrase of an old saying says that when you buy cheap, it comes out expensive in the end. So, who pays the price for the inadequate approaches to race and racialized inequality in mathematics education discussed in this article? Clearly, a price continues to be paid by students who assert their African American, Native American, and Latino identities. These students continue to be constructed in the extant literature as low achievers and mathematically illiterate. Rarely do we hear reports of student success despite a growing body of research showing that African American, Latino, and Native American students are able to draw on their cultural and community knowledge to help them succeed in mathematics.

A price is also paid by students belonging to the many Asian American subgroups. These students' educational, emotional, and social needs are often neglected because of widely held beliefs that issues of racism and racialized inequality are not relevant in their lives. However, my 14 years of teaching mathematics to Hmong, Mien, Laotian, Thai, Filipino, Vietnamese, and Cambodian students in the California community college convinced me that many of these students often face tremendous struggles in their educational and out-of-school experiences. The racialized construction and rendering of Asian Americans as high achievers and model minorities becomes problematic in light of these challenges and struggles (e.g., S. Lee, 1996, 2005).

White students—many of whom do not recognize or readily accept that they, too, are positioned by and often benefit from the meanings that

society and its institutions assign to Whiteness—also pay a price (e.g., Forman, 2004; Lewis, 2004). The invisible privileges that often come with Whiteness include not having one's abilities questioned in the socially denigrating ways that are experienced by African American, Native American, and Latino students (McIntosh, 1989). As a result, many White students “have little to no sense of themselves as situated socially and historically in ways that differentially reward their ‘hard work’ and/or ‘merit’” (Lewis, p. 641).

Finally, the field of mathematics education pays a price. Despite research advances on several fronts during the last two decades—teaching, learning, curriculum, and assessment—the field is perennially confronted with the reality of underperformance and limited persistence for African American, Native American, and Latino students. This is a clear signal that extant research and intervention has not properly addressed the needs of these students.

## CONCLUSION

I opened this article by describing two specific incidents and repeating a widely proliferated statement as a way to open a conversation suggesting that race and racism are important considerations in mathematics learning and participation. My goal was to build a more general argument suggesting that disparities in achievement and persistence have been inadequately framed as reflecting race effects rather than as consequences of the racialized nature of students' mathematical experiences. I argued that this inadequate framing is reflective of a racialization process that continues to legitimize the social devaluing and stigmatization of many students of color. This racialization process has contributed to a widely accepted and largely unchallenged racial hierarchy of mathematical ability that puts African American, Latino, and Native American students at the bottom and Whites and Asian students at the top.

In deconstructing this racialization process and the formation of this ability hierarchy, I offered a more nuanced treatment of race, racism, and racialized inequality. I explained how this hierarchy is an outgrowth of racial hierarchies that have developed over the nation's history and that have privileged Whiteness.

I believe that the discussion in this article helps explain why—despite the fact that race impacts most areas of life for African American, Latino, Native American, Asian American, *and* Whites—there exists little theoretical or empirical research that attempts to assess the salience of race and racism in relation to mathematics learning and participation.

However, it can be asked whether it is simply impoverished understand-

ings of race and racism that account for the lack of insightful research in these areas within mathematics education. It has been said, “We teach what we value.” A similar statement could be made: “We research what we value.” Within mathematics education, the research that is valued most is that which gives primacy to teaching, learning, curriculum, and assessment. This work often proceeds without regard to issues of race, racism, and racialized inequality because it is believed that inequities will be remedied as a residual effect of good teaching and good curriculum. Yet, researchers guiding these studies of good teaching and good curriculum might consider questions such as these: Does my research contribute to a racialization process that stigmatizes African American, Latino, Native American, or Asian American students? Does my research ignore race or take a color-blind approach to race and racism despite the fact that teaching, learning, assessment, and curriculum design in my study take place in highly racialized spaces and under highly racialized social conditions? Does my research privilege or normalize White students and Whiteness or ignore the role of race in these students’ mathematical experiences and identity construction? Or does my research contribute to efforts to eliminate inequities and disparities in achievement and persistence?

Rather than having explicit and honest discussions about the racialized nature of students’ mathematical experiences, race-neutral approaches that frame equitable outcomes as a residual product or natural consequence of good mathematics teaching and good mathematics curriculum are clearly preferred (e.g., RAND Mathematics Study Panel, 2003). In a highly political, standards-driven context, good teaching and good curriculum—that is, anything but a thorough consideration of race and racism—are seen as the great equalizers (e.g., NCTM, 1989, 2000; NRC, 1989, 2001; RAND Mathematics Study Panel).

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### *Notes*

1. Around the same time that the comments about African Americans were made by the chair, the math department was also engaged in a fierce tenure battle with a prominent female mathematician who was initially denied tenure. After suing the university, the faculty member eventually won her case and became one of just two tenured women on the faculty.
2. The tendency in mathematics education research has been to use these labels to

represent *collective* African American, *collective* White, *collective* Asian American, and so on, without regard to intragroup diversity or the ways in which racial identities are assumed by individuals rather than being ascribed by others. In this article, I use these labels as they are used in math education research in order to structure my critique.

3. The absolutist perspective has been challenged by those advocating for a social constructivist perspective. See Ernest (1991) for an excellent discussion of both perspectives.

4. It is highly doubtful that if achievement disparities were reversed, with White students trailing African American, Latino, and Native American students, that these disparities would be referred to as "racial achievement gaps."

5. I am not arguing against disaggregation of data per se. Much can be learned about discrepancies in resources and experiences. My argument is focused on the conceptualization of racial category labels as deterministic and causal and the failure of extant mathematics education research and policy to interrogate this conceptualization.

6. The "Latin Americanization" thesis suggests that racial stratification in the United States is moving away from the biracial Black-White system to a triracial system of "Whites," "Honorary Whites," and "Collective Black" (Bonilla-Silva & Glover, 2004). According to the model, a few Asian origin people fall into the first category. Japanese, Korean, and Chinese fall into the second. Filipinos, Vietnamese, Hmong, and Laotians fall into the third.

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